

1. $(g \circ f)(x)$

$$3(7x-9) - 2$$

$$21x - 27 - 2$$

$$= 21x - 29$$

2. (a) $(f \circ g)(x)$

$$3(2x-1)^2 - 5(2x-1) + 2$$

$$12x^2 - 12x + 3 - 10x + 5 + 2$$

$$= 12x^2 - 22x + 10$$

(b) $(g \circ f)(x)$

$$2(3x^2 - 5x + 2) - 1$$

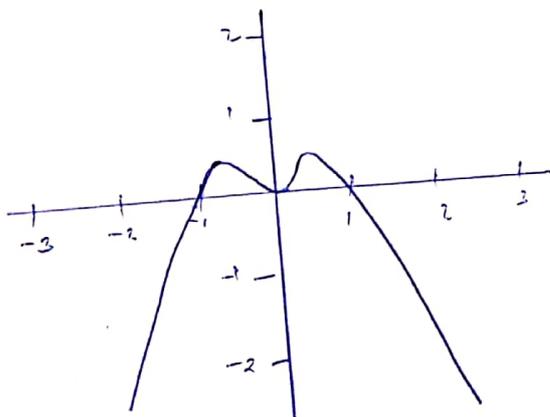
$$= 6x^2 - 10x + 3$$

1. $g(x) = (x+2)(3x-1)(x+7)^2$

degree = 4

Max no. of turning points = 4 - 1 = 3

2.



3. (a) domain = $(-\infty, \infty)$

(b) range = $[4, \infty)$

(c) increasing = $(3, \infty)$

(d) decreasing = $(-\infty, 3)$

1. $9x^2 + 2x - 3$

$a = 9 > 0$ (opens upwards, will find minimum value)

$$x = -\frac{b}{2a} = \frac{-2}{2(9)} = -\frac{1}{9}$$

$$f(-\frac{1}{9}) = 9(-\frac{1}{9})^2 + 2(-\frac{1}{9}) - 3$$

$$= -\frac{28}{9}$$

Minimum point: $x = -\frac{1}{9}$

Minimum value: $-\frac{28}{9}$

2. $-4x^2 - 3x + 2$

x-intercepts

$$-4x^2 - 3x + 2 = 0$$

$$x_{1,2} = \frac{3 \pm \sqrt{9 - 4(4)(-2)}}{2(-4)}$$

$$= \frac{3 \pm \sqrt{41}}{-8}$$

$$= \left(\frac{-3 + \sqrt{41}}{8}, 0 \right), \left(\frac{-3 - \sqrt{41}}{8}, 0 \right)$$

y-intercept

$$y = -4(0)^2 - 3(0) + 2$$

$$y = 2$$

$$= (0, 2)$$

3. $x^2 + x - 56$

$$x^2 - 7x + 8x - 56$$

$$x(x-7) + 8(x-7)$$

$$= (x+8)(x-7)$$

2. $18x^2 + 30x - 12$

$$6(3x^2 + 5x - 2)$$

$$6(3x^2 - x + 6x - 2)$$

$$6(x(3x+1) + 2(3x-1))$$

$$= 6(x+2)(3x-1)$$

3. $18x^2 - 96x - 72$

$$6(3x^2 - 16x - 12)$$

$$6(3x^2 + 2x - 18x - 12)$$

$$6(x(3x+2) - 6(3x+2))$$

$$= 6(x-6)(3x+2)$$